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INCINERATION

THE MODERN METHOD



THE HISTORY OF THE

ROYAL SOCIETY OF LONDON



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DEAN

Incinerators

for the Sanitary Disposal of Refuse

CATALOG No. 9

WASHBURN & GRANGER *inc.*
50 Church St., New York
Works — Myerstown, Pa.

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INCINERATION

SANITARY and economical methods for garbage and refuse disposal are becoming more and more urgent as the dangers of the public dumping ground have been definitely established. Community destructor plants will undoubtedly solve this problem for the average home, but for institutions, hospitals, apartment houses, hotels and other large units, the public- or community-owned plant will be only partially effective. It is necessary to attack this problem at the origin, not at the end; to provide a means of disposal where the waste is created.

The advantages of this system are self-evident—the safeguarding of health, the elimination of the disease-breeding garbage with all its offensive smells, flies and vermin; the absence of the unsightly array of garbage cans and littered sidewalk, and the saving in cartage which in many instances reaches a considerable yearly expense.

For several years we have built, in connection with our “Dean” Shaking and “Dean” Dumping Grates, incinerators of our own design for the disposal of garbage and factory waste.

The purpose of this booklet is to discuss the salient features of “Dean” Incinerators and Destructors, and to illustrate some of the more difficult installations which our engineering force has successfully completed.

No attempt is made to present standard specifications, as each installation is of necessity an individual problem in which many factors enter in varying degrees.

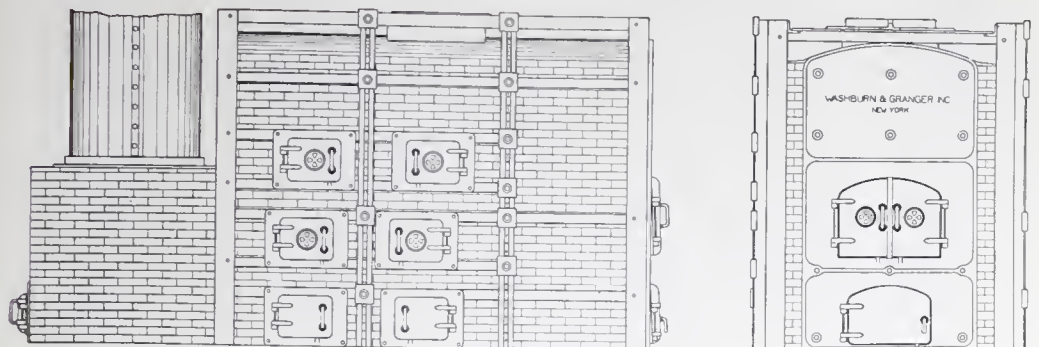
We are prepared to give architects, engineers and municipal officials interested in the erection of new structures, the fullest co-operation in designing Incinerators and Destructors particularly adapted to the conditions present.

We cordially invite the correspondence of the management of hospitals, public institutions hotels, industrial plants, etc., who are in need of an economical and more sanitary method of handling refuse.



WASHBURN & GRANGER, Inc.
50 Church St., New York City.

INCINERATORS AND DESTRUCTORS



Type "A" Destructor

THIS type has been developed for large hospitals, asylums, sanitariums, hotels, colleges, Federal and State institutions and Community Destructor Plants.

The garbage is charged from the top onto fire brick arches and as it dries it is worked to the lower arches and finally consumed and the ashes removed through doors at the bottom of the setting. The brickwork is reinforced by a structural steel framing, consisting of angles to which all door frames are bolted; channel iron buckstays are placed along the sides of the setting and are held in position at the bottom by cast iron shoes and at the top by heavy tie rods.

The fire brick roof consists of a sprung arch of large blocks with tongue and groove joints, or is of the flat suspended type constructed of large blocks so arranged that any one block may be removed without disturbing the surrounding blocks.

These destructors are built to burn wood, coal, coke, gas or oil fuel, and are equipped with forced draft apparatus to create a high temperature, which is absolutely necessary to avoid offensive odors and maintain a high rate of combustion.

We also furnish any flue and stack that may be required in connection with the installation of a destructor.



Type "B" Incinerator

THIS type has been specially designed for the burning of factory and miscellaneous refuse. It may be charged from the top or from the front as local conditions and the character and quantity of the refuse may dictate.

When bulky material, such as barrels, boxes and crates, is to be burned, a large charging opening is provided in the front which is covered by a heavy counterbalanced cast iron door, lined with refractory material.

The Incinerator is provided with a heavy cast-iron front and the entire setting is encased in a structural steel framing, consisting of horizontal angles in the side and heavy vertical angles at the corners. Side walls are reinforced with steel I-Beam buckstays, tied together across the top with heavy tie rods. All castings are bolted to the structural steel frame.

INCINERATORS AND DESTRUCTORS



Type "C" Incinerator

DESIGNED for public schools, public buildings, museums and similar institutions where the destruction of paper and other light material is required.

This incinerator is small but well built to withstand the high temperature, produced by the burning of light refuse. It is provided with a heavy cast-iron front complete with doors, held in position by through tie-rods and rear buckstays.

The walls are 17 inches thick consisting of 9 inches of fire brick and 8 inches of red brick. The roof arch is semi-circular and is built of 9" wedge and 9" straight fire brick. The side walls are run up to the top of the arch and provided with cast iron buckstays and heavy tie rods. The space over the arch is filled with cinder and paved with red brick laid flat and grouted with cement mortar.

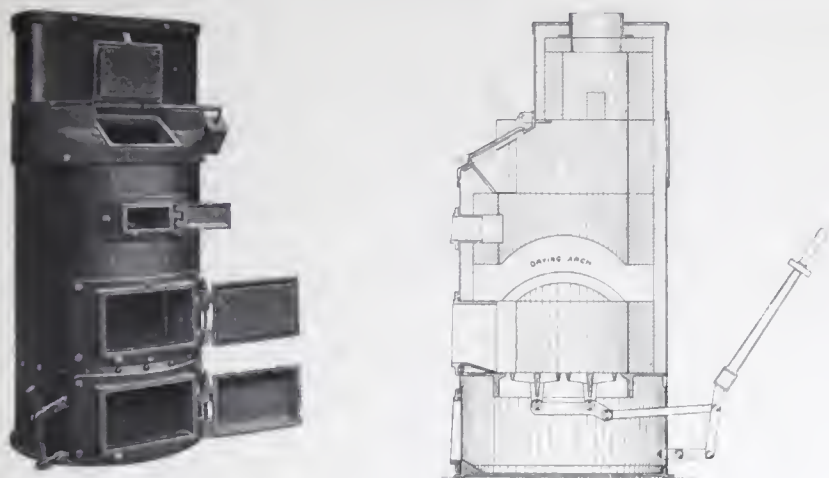
INCINERATORS AND DESTRUCTORS



U. S. S. Melville

Type "D" Destructor

THIS type which has been designed and built for marine use will be of interest to marine architects and engineers. The outer shell is constructed of sheet steel, reinforced with suitable channels and angles. The radiation of heat is reduced to a minimum as the shell of the furnace is insulated with Sil-o-Cel linings. A hoist is provided for raising the cans to the charging hopper and is so built that the handle does not revolve when the cans are lowered. The revolving head is fitted with ball bearings, making it exceptionally easy to turn the can into position. The entire operation of opening and closing the cover of the charging hopper by means of a counterweight and the raising, emptying and lowering of the cans is accomplished from the deck level and by one man. As the garbage is partially dried, it is worked through to the bottom of the destructor by tipping the trays which are operated by levers at the front. The furnace is provided with a shaking grate and as the ash forms it is worked through to a pan at the bottom. Crude oil, atomized by air or steam, is used for fuel. A drain is installed to carry off excess liquids not consumed in operation.



Type "E" Destructor

THE semi-portable destructor illustrated above consists of a cylindrical steel shell, insulated with Sil-o-Cel powder and lined with 4" of fire brick shapes, especially manufactured for the purpose. It is provided with a charging door near the top and a fire brick drying arch near the centre which holds the garbage, or other refuse matter in suspension until dried out by the ascending gases from the fire. A stoking door is provided in front of the drying arch so that the material can be worked through to the shaking grates where it is completely consumed. Ashes as formed are removed through the bottom door.

This destructor is built to burn coal, crude oil, kerosene or gas as fuel and is equipped with a motor driven blower for supplying forced draft.

Type "E" has been designed for clubs, apartment houses, large restaurants, residences, community buildings, state institutions, sanitoriums, and similar places. The destructor measures 34" in diameter by 6' 4" high and weighs about 3500 pounds. Capacity approximately 100 pounds per hour.



*The Brooklyn Institute
of Arts and Sciences*

Public Building Incinerators

IN the operation of large public buildings there is usually a considerable accumulation of rubbish, paper and floor sweepings. The cleanest and most economical method of disposing of this refuse is by incineration, or burning. It can be collected as often as desired and immediately burned, thereby saving the expense of storing and having it removed from the premises by wagon at irregular intervals. The money saved in cartage at some institutions during a short period of time has been enough to pay for the cost of an incinerator.

The incinerator which we installed in the Museum illustrated above is approximately the same as shown on page 7. Our "Dean" Dumping Grates, as described on page 14, are also installed under the steam boilers in the power plant of this institution.

INCINERATORS AND DESTRUCTORS



The Brooklyn Hospital

Hospital Destructors

THE sanitary requirements of Hospitals in relation to the removal and *destruction* of refuse material from the various operating rooms, laboratories and kitchens should be very severe, and justly so, as the dangers arising from the common garbage can with its offensive odors and consequent disease germs is too well known to require comment here.

The installation of a "Dean" Destructor located at some central point will provide the means of disposing of all refuse matter as soon as collected, in a sanitary and economical manner.

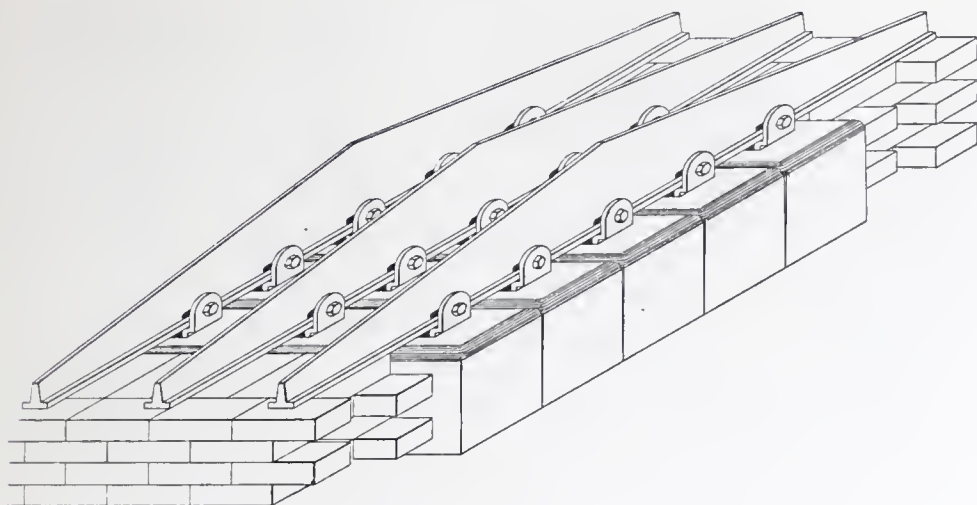
The Hospital illustrated above is equipped with a Type "A" destructor, as described on page 5 and the boilers in the power plant are furnished with the "Dean" Dumping Grates, as described on page 14.



THE plant illustrated above was designed and erected by us for one of the largest automobile accessory plants in the East. Constructed for the disposal of saw dust floor sweepings, garbage and plant refuse. Equipped with a "Dean" flat suspended arch, as described fully on page thirteen. Steel stack lined with tongue and groove fire brick blocks to protect it from the high temperature gases. Capacity two tons per day of eight hours.

Prior to the completion of this incinerator, the refuse was removed under yearly contract at a cost which paid for the plant in twelve months.

INCINERATORS AND DESTRUCTORS



The "Dean" Flat Suspended Furnace Arch

THE "Dean" flat suspended furnace arch is designed to provide for unusual expansion and contraction and economy in maintenance and renewal. Blocks are 9" x 12" suspended from cast iron tees and held in place with clips and bolts. The finest Pennsylvania flint clays are used in the manufacture of these blocks, which are thoroughly baked and have a fusing temperature of 3200 F. Each block can be renewed independent of all others and the stresses and strains incidental to all sprung arches supported by skewbacks are eliminated. The side walls of the furnace can be relined independent of the flat suspended arch, the entire weight of which is carried by the structural steel frame, independent of the brick work. Insulated with Sil-o-cel powder and grouted with cement mortar.

Recommended for all high temperature incinerators where minimum expense for repairs is desired rather than initial low cost.

This arch can also be used for the rear combustion chamber of horizontal return tubular boiler settings.

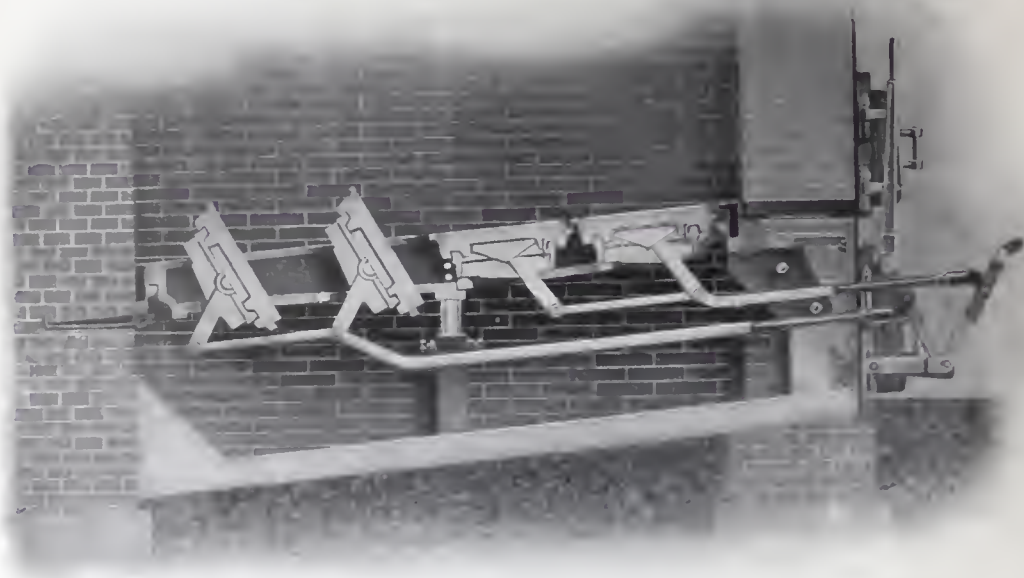


PLATE No. 7

“Dean” Dumping Grates

PLATE No. 7 illustrates the side elevation of the “Dean” Dumping Grate, as installed for burning fine, Anthracite coal.

The principal feature which has brought the “Dean” Dumping Grate into the front rank is the method of supporting the bar at both ends by means of a rectangular frame or cradle. This construction eliminates the large slot in the centre of the grate, which is objectionable as it weakens the casting and allows it to warp downward on the ends, and also to bind on the shaft which supports it. The two points of bearing as embodied in the “Dean” bar remove all tendency to warp and the strength of the bar is greatly increased by the heavy web running through the centre.

Investigation of installations that have been subjected to hard service shows that the bars retain their original shape and have longer life than the old type bar having the journal slot in the centre.

Detailed description in Catalogue No. 7 sent on request.

DEAN MECHANICAL GRATES



PLATE No. 15

“Dean” Shaking Grates

PLATE No. 15 shows the “Dean” Shaking Grate as built for the use of Bituminous coal. The bars are spaced 8 inches centre to centre, allowing large openings between sections. This design is particularly adaptable to coal forming large clinkers.

The frame is supported on adjustable shoes resting on the ash pit floor. This form of construction allows the grate to expand and contract freely, a feature not found in types of grates permanently built into the brickwork.

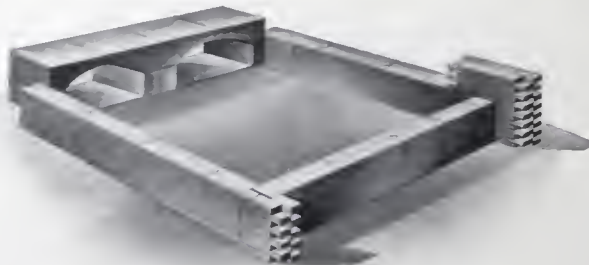
The removable top castings for the front and rear bearers are designed with horizontal tongues and grooves to eliminate the tendency of these parts to rise out of position, due to expansion and contraction.

The fingers on the bars are made with a continuous edge, as in the operation of any shaking grate most of the wear comes at this point.

Detailed description in catalogue No. 7.

Specialties

Arches—Fire Brick Flat Suspended Furnace.
Arches—Fire Brick Door.
Ash Gates.
Ash Can Hoists—Air, Hydraulic or Hand.
Boiler Fronts—Cast Iron and Steel Plate
Castings—Iron, Rough and Machined
Coal Gates
Covers—Trench, Cast Iron
Destructors—“Dean”
Floor Plates—Cast Iron Diamond Top
Furnace Equipment—Boiler
Furnaces—Boiler “Dean”
Garbage Burners—“Dean”
Grates—Dumping “Dean”
Grates—Shaking “Dean”
Grates Bars—Stationary
Hoists—Ash Can
Incinerators—“Dean”
Linings—Furnace, Fire Brick—“Dean”
Plates—Trench, cast-iron
Special Machinery—Built to customers drawings
Stokers—Hand operated “Dean”
Track—Industrial Railway, cast-iron
Turntables—Industrial Railway, cast-iron.



“Dean” Fire Brick Furnace Linings



